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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/058,454

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Andreas Falk

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30593

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EXAMINER

LAXTON, GARY L

ART UNIT

PAPER NUMBER

2838

DATE MAILED: 03/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/058,454

Applicant(s)

FALK ET AL.

Examiner

Gary L. Laxton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5. 6) ☐ Other: ____

DETAILED ACTION

Inventorship

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Drawings

2. The drawings are objected to because figures 1 and 4 should be labeled with descriptive labels. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Figures 1 and 4 require labeling.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the full bridge of claim 15, and the mechanical switches of claim 16

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must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

5. The claims are replete with errors and have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification some examples are provided.

6. Claims 1-23 are objected to because of the following informalities:

Claim 1 recites "the output lines" in line 7. There is insufficient antecedent basis for this limitation in the claim. Claims 2-23 inherit the same.

Claim 11 recites "the common secondary". There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites “the $n+1$ secondary part windings”. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 recites “the circuit” in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 line 1, recites “the transformer primary converter”. This does not make sense.

Claim 14 line 2, recites “may be operating synchronism”, this is vague.

Claim 14 line 3 recites “the resonant mode of operation”. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 line 4 recites “semiconductor switches of half bridges are clocked”. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 line 4 recites “in recuperation mode”. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 line 5 recites “semiconductor switches of the secondary”. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 is indefinite. Is this hot swapping the half bridge for a full bridge?

Claim 16 line 3 recites “the defective converter”. There is insufficient antecedent basis for this limitation in the claim.

Claim 17 recites “the at least three primary converter sections of the same kind”. There is insufficient antecedent basis for this limitation in the claim.

Claim 18 recites “the direct-current input voltage”. There is insufficient antecedent basis for this limitation in the claim.

Claim 20 recites “claim 17, the input filter”. Applicant should insert “wherein”.

Claim 21 recites “the electric circuit” in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 22 recites “semiconductor switching elements” in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 23 recites “the alternating voltage of the capacitor” line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 23 recites “the no-load voltage”. There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 5-13, 16, 19, 22 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites “between the primary converter sections the oscillating circuit” has a high decoupling impedance. This limitation is vague and indefinite. It is unclear whether the oscillating circuit is connected between the primary sections or whether the applicant has a different meaning for the limitation.

Claims 5-13, 16, 22 and 23 in line 1 recite "the circuit". Numerous "circuits" have been recited prior to the recitation "the circuit"; therefore, it is entirely unclear which "circuit" is being referenced.

Claim 7 recites "the primary converter being connected in series or parallel". First, it is unclear what the converter is being connected in series or parallel with. Secondly, there is more confusion since claim 1 recited that the converter sections were already connected in series. Therefore, the claim is indefinite.

Claim 19 recites at low direct current input voltages the direct current input voltage". First, claim 1 recites a "high input voltage", the claim did not recite the input voltage being DC; nor was there an option for inputting a low voltage. Therefore, the claim is indefinite.

Claim 23 recites the capacitor in line 3. It is unclear which capacitor is being referenced by this limitation.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 2, 7 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Reinhold et al (EP0820893).

Due to the objections and rejections stated above the examiner rejects the claims based on the best understanding of the claim limitations.

Claims 1, 7 and 21. Reinhold et al in figure 6, disclose a primary converter for rail vehicles comprising partial current regulators (40.1-40.n); a transformer (40.1-40.n; see abstract line 4; e.g. each regulator comprises a transformer); a secondary converter (41.1-41.m); wherein the primary converter includes three primary converter sections (40.1-40.n) connected in series, see figure 6, output lines of each converter are connected to respective transformer primary windings (see abstract line 4 again).

Claim 2. See figures 1 and 2.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 3-6, 8-10, 12, 14-16, 18, 19, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over of Reinhold et al in view Laeuffer.

Due to the objections and rejections stated above the examiner rejects the claims based on the best understanding of the claim limitations.

Claim 3. Reinhold et al disclose the claimed subject matter as stated in regards to claim 1 above except for each transformer primary winding having a resonance capacitor.

Laeuffer teach a converter circuit comprising a resonance capacitor C_r for providing a resonant tank circuit that is coupled to the inverter circuit.

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Reinhold et al with the teachings of Laeuffer in order to provide a series resonant converter circuit to improve circuit efficiency as taught by Laeuffer.

Claims 4 and 5. Laeuffer also teaches an inductance coil L_r that forms an oscillating circuit with the capacitor.

Claim 6. The circuit resonates at the natural frequency.

Claims 8, 10 and 23. Reinhold et al disclose the claimed subject matter as stated in regards to claim 1 above except for a capacitor array.

Laeuffer teaches utilizing a capacitor array (C1 and C2) having a symmetrical magnetic and electric structure for lossless switching connected to a half bridge circuit in known fashion (col. 2 lines 4-10) for providing a half bridge resonant converting apparatus with circuit phase and time variables.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Reinhold et al with the teachings of Laeuffer in order to provide a half bridge resonant converting apparatus with circuit phase and time variables coupled to a capacitor array and to decouple the converter sections of Reinhold

Claim 12. Reinhold et al disclose the four quadrant regulator compensates the resonance circuit.

See figures 1 and 2.

Claim 14. Reinhold et al disclose the converters are synchronized.

Claim 15. Full bridge circuits are well known replacements for half bridge circuits.

Claim 16. Reinhold et al disclose the circuits can be switched out see figure 6.

Claims 18 and 19. The input voltage is connected to the output voltage through switches. See figures 1 and 2. Furthermore, Laeuffer in figure 1 shows additional inductances.

Claims 9 and 22. Reinhold et al in view Laeuffer discloses the claimed invention except for operating switching elements at 1.2 or 1.4 times smaller than the resonance frequency. It would have been obvious to one having ordinary skill in the art at the time the invention was made switch at 1.2 or 1.4 times smaller than the resonance frequency, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

13. Claims 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reinhold et al in view of Nomura.

Reinhold et al disclose the claimed subject matter as stated in regards to claim 1 above except for using a switch and filter to operate the AC mains.

Nomura teaches a filter 4, 5 and input switch 6 to operate the mains AC power to the converter circuits and isolate it from the rest of the circuit in case of overloading. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a switch and filter to filter noise when in operation and to use the switch to isolate the circuit in overload situations.

14. Claims 11 and 13 would be allowable if rewritten to overcome the objections set forth in this Office action and rejection(s) under 35 U.S.C. 112, second paragraph, set

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forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter: prior art fails to disclose or suggest, inter alia:

Claim 11. a circuit wherein mutual coupling of a transformer primary windings and their coupling to a common secondary winding is a symmetrical magnetic coupling; the transformer arranged in the shape of discs between two secondary part windings connected in parallel or in series and are linked to a secondary converter.

Claim 13. a superimposed intermediate circuit voltage control is realized by the four quadrant regulator of the respective one of the primary converter sections; wherein the intermediate circuit voltage control compensating a static residual asymmetry of the resonance circuit so that the primary converter sections differ.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary L. Laxton whose telephone number is (703) 305-7039. The examiner can normally be reached on Monday thru Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on (703)308-1680. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7724 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


Adolf Denske Barham
Primary Examiner